

RELATION BETWEEN INTELLIGENCE AND PHYSICAL FITNESS
OF EIGHTH GRADE GIRLS ENROLLED AT
SALINA JUNIOR HIGH SOUTH SALINE, KANSAS 1967-68

by

PATRICIA MONTY 265

B.S., Marymount College, 1967

A MASTER'S THESIS

submitted in partial fulfillment of the
requirements for the degree

MASTER OF SCIENCE

College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1968

Approved by:

Charles M. Beards
Major Professor

LD
2668
T4
1968
M658
c.2

ACKNOWLEDGMENTS

A sincere thank you to the Salina Public School System and Sister Miriam Edward Vaughn for their cooperation.

The writer wishes to express deep appreciation to Dr. Charles Peccolo for his guidance and assistance in this study.

TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION.	1
Statement of the Problem.	2
Definition of Terms	2
Limitations and Delimitations	2
II. REVIEW OF THE LITERATURE.	4
III. PROCEDURE	8
Type of Study	8
Description of Sample	8
Measuring Devices	14
Description of the Tests Included in AAHPER	15
Method of Analysis.	17
IV. ANALYSIS OF THE RESULTS	19
V. SUMMARY AND CONCLUSIONS	23
APPENDIX.	25
BIBLIOGRAPHY.	50

LIST OF TABLES

TABLE	PAGE
I. Physical Characteristics of the Girls in the Study at the Beginning and End of the School Term.	10
II. Overall View of the Sample in Terms of the Number of Students Included in the Rankings of I.Q. and the Six Fitness Tests.	19
III. Correlation of I.Q. and Physical Fitness Summary.	20
IV. Correlation Summary	24
V. Rank Difference Correlation of I.Q. and Sit-ups	26
VI. Rank Difference Correlation of I.Q. and Broad Jump.	30
VII. Rank Difference Correlation of I.Q. and 50-Yard Dash.	34
VIII. Rank Difference Correlation of I.Q. and 600-Yard Walk-Run	38
IX. Rank Difference Correlation of I.Q. and Shuttle Run	42
X. Rank Difference Correlation of I.Q. and Softball Throw.	46

CHAPTER I

INTRODUCTION

The concept of fitness has a long and involved history. According to literature on the subject, it can be traced in recent times to the work done by Darwin on the survival of the fittest. Always the word fitness has suggested the ability of an animal or a human to work and play with a maximum degree of physical efficiency and to be prepared to meet unforeseen danger or destruction.

Basically, physical fitness has always been an important consideration in physical education. There have been periods when particular stress has been placed on fitness, particularly when published statistics have indicated deplorable physical conditions among American citizenry. Draft rejections from both World Wars I and II received wide publicity. In each case measures were proposed and changes were made. While there were some lasting effects, the uproar died down after a period of time.¹

In 1954 a study of far reaching influence was made. Dr. Hans Kraus compared the strength and flexibility of American and Central European children. The comparisons in themselves do not seem earthshaking, but the American Press raised a national hue and cry over the weaknesses of American children, and the new fitness movement was on. The first important result was the creation of President Eisenhower's Youth Fitness Council in 1956. Since its

¹Victor P. Dauer, Fitness for Elementary School Children (Minneapolis: Burgess Publishing Company, 1966), p. 7.

continuation by Presidents Kennedy and Johnson, the work of the Council has had far reaching effects on the quality of school physical education programs.²

Statement of the problem

It was the purpose of this study to investigate the relationship of physical fitness to intelligence at the Junior High level. More specifically the hypothesis tested was:

H₀. There is no significant relationship between intelligence and physical fitness as measured by a standardized physical fitness test.

Definition of terms

SRA Primary Mental Ability Test. These tests are designed to provide both multifactored and general measures of intelligence.

Physical Fitness. Implies such concepts as muscular effort where quality and intensity are involved, the ability to handle the body well, performing physically up to one's capacity, being able to recover rapidly from fatigue, and possessing such components as speed, strength, endurance, agility, and coordination.

Limitations and Delimitations

Environmental factors, both material and social, motivation, teacher verbalization, student interest, past experience, and growth rates account for variations in fitness skills and in the performance of the students of South Junior High.

²Ibid., p. 7.

The eighth grade girls were in 10 classes. Group I (5 classes) alternated with Group II (5 classes) every school day. As a result the tests were administered at different times for two days during the student's P. E. class.

Both boys and girls were in the same gym without a dividing curtain. The writer felt that this may have affected the girls' performance on the AAHPER (American Association of Health, Physical Education, and Recreation--the abbreviation AAHPER will be used throughout the remainder of the paper) test.

The physical fitness tests were given at the beginning of the school term. Not having a regular physical education program through the summer months many students were in poor physical condition.

All of the tests involved timing and scoring. The teacher could not administer all seven tests for each girl without using some of the students as scorers. This could lead to errors in recording results.

Both fourth hour classes were eliminated from the study because the SRA Primary Mental Ability Test was not given to the students in these classes. The guidance office did not have a sufficient number of tests and there were no facilities available over the lunch hour. This eliminated 32 students.

The writer compared the AAHPER test scores with the I.Q. scores which are not an exact measure of the student's intelligence. These scores are only an estimation of the student's I.Q. on a certain day.

The AAHPER flex-arm hand was omitted because it was not administered properly.

CHAPTER II

REVIEW OF THE LITERATURE

Most of the literature on Physical Fitness is very current as a result of the President's Council on Youth Fitness in 1956. The effects of the current research can be seen everywhere. The T.V. stations have exercise programs, physical fitness contests are sponsored by community recreation departments, and many professional journals report on the latest research in the field.

Since its formation in 1855, the American Association for Health, Physical Education, and Recreation has been deeply concerned with ways to improve the fitness of American boys and girls. One of its most effective contributions has been the steady emphasis and stimulation exerted through the Youth Fitness Test Project initiated in 1958. The writer has used the AAHPER Youth Test and literature printed by this organization since it is very current.

In the fields of physical education and general education there is much controversy over the place and importance of programs for physical fitness in connection with the total education of the student. There does seem to be meager scientific proof that there is a relationship between physical fitness and academic achievement. Hart and Shay indicated that when one feels well physically, one is able to function at a higher level academically.³

³Hart, Marcia and Clayton Shay. "Relationship between Physical Fitness and Academic Success," Journal of Health, Physical Education and Recreation, (October, 1964), 443.

Stein stated that in early childhood, mental and physical activities are closely related, and motor activities play a major role in intellectual development.⁴

Another theory has been that a low fitness student fatigues easily and then has difficulty in performing complex mental tasks.⁵

Using feeble-minded girls as his subjects, Brace concluded that there was a slight relationship between I.Q. and the ability to learn gross bodily motor skills of a sport type. He suggested that the amount of participation in physical activities during the important periods of physical growth is influenced by slight differences in intelligence which may also have significant effect upon the ability to learn and perform such skills. Emotional reaction patterns, rather than lack of physical abilities, may also have operated to produce poor performance scores.⁶

In a study of superior, normal, and subnormal fifth and sixth-grade boys and girls, Kulcinski reported on the relationship between various degrees of intelligence and the ability to learn 22 fundamental muscular skills. He found a highly positive relationship between those variables: subjects of superior and normal intelligence scored significantly above the subnormal group on the difficult battery of tests.⁷

⁴Stein, Julian. "Motor Function and Physical Fitness of the Mentally Retarded," Rehabilitation Literature, XXIV (August, 1963, 231.

⁵Gutin, Bernard, "Effect of Increase in Physical Fitness on Mental Ability Following Physical and Mental Stress," AANPER Research Quarterly, XXXVII (May, 1966), 211-220.

⁶Brace, D. K. "Motor Learning of Feeble-Minded Girls," Research Quarterly, (December, 1948), 269-275.

⁷Kulcinski, L. E. "The Relation of Intelligence to the Learning of Fundamental Muscular Skills," Research Quarterly, American Association of Health, Physical Education and Recreation (December, 1945) 266-275.

Brace reported that motor learning of sport-type skills is dependent to a considerable degree upon physical fitness expressed in terms of strength, speed, agility, and power. Wellman postulated that certain tests designed to measure native motor ability probably fail to do so to any useful degree, while the simplest physical fitness tests prove more valid in measuring actual skill.⁸

Sloan investigated the relationship of motor proficiency and intelligence with 20 mentally defective subjects from the Lincoln State School compared with 20 children of average intelligence as controls. Within the limits of the study, a definite positive relationship was found as the mental defectives scored significantly lower than the normal children in all six test areas.⁹

Davis and Lawther stated that there is much difference of opinion over individual differences in ability to learn. Much of the controversy is over the relative influence of inborn ability and of environmental factors as determiners of the intellect. One view, according to Davis and Lawther is that inborn intelligence determines almost entirely one's degree of success or failure in schoolwork and life. The opposing view held by Bagley is that environment is the controlling factor.¹⁰

In the field of Physical Education clumsiness and awkwardness seem to indicate lack of suitable activity-experience rather than inability to learn. Most motor tests merely measure acquirment of skill to date. It seemed probable that with fostering environment, adjusted teaching techniques, strong

⁸Stein, Julian, Op. cit., p. 236.

⁹Ibid., p. 236.

¹⁰Davis and Lawther, Successful Teaching in Physical Education (New York: Prentice Hall, 1948), p. 287.

motivation, and adequate time, most individuals could acquire such basic body control skills as are essential for ease, grace, and efficiency of movement in ordinary activities of life.¹¹

Some positive correlation between excellencies in traits have been found. One who seems to learn baseball rapidly is more likely than not to learn basketball or tennis rapidly. The correlation is positive but very low between motor excellence and mental excellences. Physique and intellect tend to show little relationship.¹²

The results of studies on the degree of relationship which exists between mental development and various aspects of physical growth have been somewhat conflicting. Early investigators, such as Terman and Witty reported positive relationships between advanced growth and mental development. Terman concluded that gifted children were taller and heavier than the average. Witty's study of gifted children showed that they are not physical weaklings but, rather, tend to be average in physical development and health. More recent studies indicated that close relationships of mental and physical growth do not necessarily occur. Jones found little relationship between physical defects and intelligence level.¹³

¹¹Ibid., 284.

¹²Ibid., p. 303.

¹³Sapora, Allen and Elmer Mitchell, The Theory of Play and Recreation (New York: The Ronald Press Company, 1961), p. 255.

CHAPTER III

PROCEDURE

Type of Study

A correlational study involving the eighth grade girls of Salina Junior High South was designed.

Correlational studies include all of those research projects in which an attempt is made to discover or clarify relationships through the use of correlation coefficients. Correlational research compares members of a single group in which the studied characteristic is present in varying degrees. The basic design of correlational research involves the collecting of two or more scores on the same group of subjects and computing correlation coefficients.

Description of sample

At the time of this study the Salina School system had an enrollment of 10,120 pupils. 6,084 students were in the elementary system and 4,358 in grades 7-12.

There are two junior high schools, Salina Junior High South and Roosevelt-Lincoln. At the time of the study the enrollment for Salina Junior High South was 910 and the school was staffed with 43 teachers. Roosevelt-Lincoln had a total of 1308 pupils and 60 teachers.

The girls participating in this study included eighth grade girls of Salina Junior High South, except for 32 girls in both fourth hour classes who were eliminated due to shortage of tests and lack of facilities.

The 89 eighth grade girls were divided into the following classes:

Group I

1st hour--conference period
2nd hour-- 6
3rd hour--10
4th hour-- 0
5th hour--13
6th hour--15

Group II

1st hour--conference period
2nd hour--11
3rd hour-- 8
4th hour-- 0
5th hour--10
6th hour--16

Physical characteristics of each student has been given in Table I.

TABLE I

PHYSICAL CHARACTERISTICS OF THE GIRLS PARTICIPATING
IN THE STUDY AT THE BEGINNING AND END OF THE SCHOOL TERM

STUDENT	HEIGHT AT BEGINNING OF SCHOOL TERM	HEIGHT AT END OF SCHOOL TERM	WEIGHT AT BEGINNING OF SCHOOL TERM	WEIGHT AT END OF SCHOOL TERM
1	5'2	5'5	105	120
2	5'2	5'4	95	110
3	5'6	5'7	179	180
4	5'0	5'1	100	110
5	5'2	5'4	178	175
6	5'4	5'6½	95	112
7	5'5	5'5	95	105
8	4'11	4'11½	90	95
9	5'2	5'3½	100	105
10	5'3	5'4	102	108
11	5'1	5'2	105	107
12	4'9	5'1	100	110
13	5'1	5'3	140	138
14	5'0	5'4	100	110
15	5'7	5'7	137	140
16	5'0	5'2	120	108
17	4'10	4'11	81	86
18	5'4	5'6	120	140
19	5'4	5'5	125	127
20	5'3	5'3½	115	118

TABLE I (CONT.)

STUDENT	HEIGHT AT BEGINNING OF SCHOOL TERM	HEIGHT AT END OF SCHOOL TERM	WEIGHT AT BEGINNING OF SCHOOL TERM	WEIGHT AT END OF SCHOOL TERM
21	5'1	5'2½	104	107
22	5'0	5'1	120	118
23	5'1½	5'3	139	135
24	5'3	5'4½	110	113
25	5'2	5'5	110	125
26	5'1½	5'3	112	109
27	5'1½	5'2	95	96
28	5'3	5'4	93	98
29	5'3	5'5	120	115
30	5'3	5'3	130	118
31	5'1	5'2½	99	102
32	5'0	5'3	148	152
33	5'3½	5'5	125	130
34	4'11	5'1	90	96
35	5'5½	5'6 3/4	138	148
36	4'9	4'11	119	120
37	5'4½	5'6	169	149
38	5'0	5'1½	86	90
39	5'4	5'5	99	106
40	5'4	5'5	102	110
41	5'6	5'7 3/4	150	142
42	5'0	5'2	130	124
43	5'4	5'6	98	110

TABLE I (CONT.)

STUDENT	HEIGHT AT BEGINNING OF SCHOOL TERM	HEIGHT AT END OF SCHOOL TERM	WEIGHT AT BEGINNING OF SCHOOL TERM	WEIGHT AT END OF SCHOOL TERM
44	5'8	5'8	110	125
45	5'2	5'4	95	104
46	5'3 $\frac{1}{4}$	5'4	120	124
47	5'5 $\frac{1}{2}$	5'6	102	107
48	5'4	5'6	120	125
49	5'5 $\frac{1}{2}$	5'6	132	135
50	5'1	5'2	145	141
51	5'3	5'3	115	115
52	5'3	5'5	99	105
53	5'2	5'4	121	124
54	5'3	5'3 $\frac{3}{4}$	112	108
55	5'2	5'3 $\frac{1}{2}$	105	115
56	5'3	5'4	105	120
57	4'11	5'1 $\frac{1}{2}$	85	95
58	5'2	5'4	95	95
59	5'6	5'8 $\frac{1}{2}$	120	125
60	5'3	5'3	110	112
61	5'2 $\frac{1}{2}$	5'3	113	121
62	5	5'1	150	155
63	5'1	5'2 $\frac{1}{2}$	95	105
64	5'0	5'3	99	103
65	5'1 $\frac{1}{2}$	5'3	140	130
66	5'2	5'4	135	128

TABLE I (CONT.)

STUDENT	HEIGHT AT BEGINNING OF SCHOOL TERM	HEIGHT AT END OF SCHOOL TERM	WEIGHT AT BEGINNING OF SCHOOL TERM	WEIGHT AT END OF SCHOOL TERM
67	4'11	5'2	95	108
68	5'3	5'3	98	110
69	5'1½	5'4	142	146
70	5'1	5'1½	120	118
71	5'2½	5'4½	106	106
72	4'8	4'11	65	68
73	5'6	5'7	138	136
74	5'2	5'3½	125	130
75	5'0	5'2	100	106
76	5'1	5'1½	86	90
77	5'2	5'3½	120	125
78	5'3	5'4	102	108
79	5'2	5'3	140	132
80	4'9½	4'11	85	87
81	5'1½	5'4	104	112
82	5'3	5'6½	118	123
83	5'6½	5'6½	135	127
84	5'2	5'6	110	116
85	5'0	5'½	95	103
86	4'8	4'9	80	85
87	5'3	5'4½	90	102
88	5'1	5'2	85	95
89	5'2	5'3	86	95

Measuring devices

The PMA (Primary Mental Ability Test) is designed to provide both multifactored and general measures of intelligence. It helps counselors and teachers to evaluate, understand and interpret the individual differences in behavior and performance among children who appear to be of comparable intelligence.¹⁴

The five factors of intelligence measured in the PMA series include the following: 1) verbal meaning, 2) number facility, 3) reasoning, 4) perceptual speed, and 5) spatial relations.¹⁵

The general or total score--I.Q.--satisfied the need for an index of general intelligence useful in various aspects of the schools' guidance and testing programs.

The AAHPER Youth Fitness Test is composed of a battery of seven test items designed to give a measure of physical fitness for both boys and girls in grades five through twelve. The tests were selected to evaluate specific aspects of the physical status which give an over-all picture of the young person's general fitness. It is the only fitness test for which national norms have been determined.¹⁶

The test includes seven items. They are as follows:

1. flex-arm hang: judging arm and shoulder girdle strength.
2. sit-ups: for judging efficiency of abdominal and hip flexor muscles.
3. shuttle run: for judging speed and change of direction.
4. standing broad jump: which is for judging explosive muscle power of leg extensors.
5. 50-yard dash: for judging speed.

¹⁴Science Research Associates, PMA Primary Mental Abilities (Examiner's Manual for grades 6-9, revised in 1962), p. 3.

¹⁵Ibid., p. 5.

¹⁶AAHPER, Youth Fitness Test (Examiner's Manual, revised in 1965), p. 7.

6. softball throw: judging skill and coordination.
7. 600-yard run walk: for judging cardiovascular efficiency.¹⁷

Description of the tests included in AAMPER

Flex-arm hang. The height of the bar should be adjusted so it is approximately equal to the pupil's standing height. The pupil should use an over-hand grasp. With the assistance of two spotters, one in front and one in back, the pupil raises her body off the floor to a position where the chin is above the bar, the elbows are flexed, and the chest is close to the bar. The pupil holds this position as long as possible.¹⁸

Sit-up. The pupil lies on his back, either on the floor or on a mat, with legs extended and feet about two feet apart. Her hands are placed on the back of the neck with the fingers interlocked. Elbows are retracted. A partner holds the ankles down, the heels being in contact with the mat or the floor at all times. The pupil sits up, turning the trunk to the left and touching the right elbow to the left knee, returns to the starting position, then sits up turning the trunk to the right and touching the left elbow to the right knee. The exercise is repeated, alternating sides.¹⁹

Shuttle run. Two parallel lines are marked on the floor 30 feet apart. The width of a regulation volleyball court serves as a suitable area. Place the blocks of wood behind one of the lines. The pupil starts from behind the other line. On the signal, the pupil runs to the blocks picks one up, runs back to the starting line, and places the block behind the line; she then runs back and picks up the second block which she carries back across the starting line.²⁰

¹⁷Ibid., p. 7.

¹⁸Ibid., p. 17.

¹⁹Ibid., p. 18.

²⁰Ibid., p. 19.

Standing broad jump. Pupil stands behind the take-off line with feet several inches apart. Preparatory to jumping the pupil swings the arms backward and bends the knees. The jump is accomplished by simultaneously extending the knees and swinging forward the arms.²¹

50-yard dash. It is preferable to administer this test to two pupils at a time. Have both take positions behind the starting line. The starter will use the commands "Are you ready?" and "Go!" Timer stands at the finish line.²²

Softball throw. A football field marked in conventional fashion makes an ideal area for this test. The pupil throws the ball while remaining within two parallel lines, six feet apart. Mark the point of landing with a small stake. If her second or third throw is better, mark it accordingly. The best throw is recorded.²³

600-yard run-walk. Pupil uses a standing start. At the signal the pupil starts running the 600-yard distance. The running may be interspersed with walking. The timer calls out the time as the pupil crosses the finish line.²⁴

Description of procedure

The girls participating in the study included 89 eighth grade girls of Salina Junior High South. The AAHPER Youth Fitness Test was administered at the beginning of the school term. The test took approximately one week to administer along with other planned activities.

²¹Ibid., p. 20.

²²Ibid., p. 21.

²³Ibid., p. 22.

²⁴Ibid., p. 23.

The students were informed of the purpose of the study. Improvement was not emphasized until the second time the test was given. The teacher recorded each individual score on a form provided by AAHPER.

The AAHPER Youth Fitness Test consisted of seven test items. These tests were given in the gymnasium and outdoors. With the exception of the bar for the flex-arm hang, no special equipment was required. Stations for each test were worked out and clearly marked ahead of time. Arrangements were made for recording the scores and the teacher timed the events. The pupils were given a reasonable warm-up period prior to the test.

The Primary Mental Ability Test was given to all the eighth grade girls except those in Physical Education classes over the lunch hour. The school counselor administered the test.

The writer scored the tests working with the school counselor and the city guidance coordinator. These scores were then compared with the AAHPER test scores. The writer compared the over all physical fitness score with the overall intelligence score. In addition, the writer compared each individual AAHPER test score with the intelligence score. For example, to see what relationship there might be between intelligence and sit-ups.

Method of analysis

The writer used the Spearman Rank Order Correlation Coefficient to analyze the data. Rho represents the correlation of data where the individuals involved have first been ranked in order of magnitude of the trait in question. The correlation then represents the relationship of the ranks for individuals on two characteristics. For example, the writer ranked students on fitness

scores and correlated these with their ranks in I.Q. The writer considered ties in scores by averaging ranks and assigning each girl the average of the ranks in question.²⁵

The level of confidence used was .05.

²⁵Chase, Clinton. Elementary Statistical Procedures (New York: McGraw-Hill Book Company, 1967), p. 110-113.

CHAPTER IV

ANALYSIS OF THE RESULTS

An overall view of the composition of the sample in terms of the numbers of students included in the individual rankings in I.Q. and on the six physical fitness tables may be found in tabular form in the Appendix. The three I.Q. and Physical Fitness groups may be gleaned from Table II.

It is noticed that approximately half of the girls were above average in sit-ups and the 50-yard dash. It is also noted that over half of the girls were below average on the broad jump and the softball throw. On the 600-yard walk-run and the shuttle run the numbers were about the same in all three groupings. Three-fourths of the girls were average or above in I.Q.

TABLE II

OVERALL VIEW OF THE SAMPLE IN TERMS OF THE
NUMBER OF STUDENTS INCLUDED IN THE RANKINGS OF
I.Q. AND THE SIX FITNESS TESTS

Group	I.Q.	Sit-xx ups	Broadxx Jump	50-yardxx Dash	600-yardxx Walk-run	Shuttlexx Run	Softballxx Throw
Above Average	35	38	29	37	31	30	15
Average	42	26	15	24	30	26	15
Below Average	12	25	45	28	28	33	59
Total	89	89	89	89	89	89	89

* 110+ above average I.Q.; 90-109 average I.Q.; 89- below average I.Q.

xx above average 75+; average 50-74; below average 49-.

To test the hypothesis that there is no significant relationship between intelligence and physical fitness on a standardized physical fitness test, the rank difference correlation was used for indicating the relationship on one variable (I.Q.) to another (Physical Fitness tests).

As may be noted in Table III, all six fitness scores showed a positive correlation with I.Q. Although these are positive correlations of the variable, it is necessary to look more closely at these correlations for significance.

TABLE III
CORRELATION OF I.Q. AND PHYSICAL FITNESS SUMMARY

TEST	P
Softball Throw	.083
600-yard walk-run	.133
Shuttle Run	.154
Sit-ups	.167
50-yard dash	.178*
Broad Jump	.319*

*P - significant

The highest relationship was between intelligence and broad jump. This relationship was significant at the .01 level of confidence. Thus the hypothesis of no significant relationship was rejected. It is possible that the girls preformed better on the broad jump because of their strong leg muscles. Running and jumping are natural activities of children; so consequently many

performed well on this test. Another possible explanation is that the majority of students walked to school and developed leg muscles.

The next highest relationship (.178) was between intelligence and 50-yard dash. This relationship was significant at the .10 level of confidence. Thus the hypothesis of no significant relationship was rejected. Possibly body build and coordination influence the performance in this task. This is a period of rapid growth and poor coordination. The girls seemed to have a difficult time starting the race at the same moment the official did. This is probable due to eye movement coordination. Irrespective of I.Q. the girls did not perform as well as the broad jump even though this test was significant at the .10 level of confidence. (Table III).

The hypothesis of no significant relationship was accepted for the sit-up task. It appeared that because of their weak abdominal muscles the students did not perform as well. This could be the result of not having a regular exercise program during the summer months.

The shuttle run test results showed that there was little relationship (.154) with I.Q. (Table III). These junior high girls were in the in-between stage of development. Awkwardness and poor coordination frequently appeared; thus the hypothesis of no significant relationship was accepted for the shuttle run.

The 600-yard walk-run involved cardiovascular efficiency. In girls and women the heart beats faster and the blood carries less oxygen than in boys. In strenuous activity, example 600-yard walk-run, the endurance dropped. Although positive (.133) the relationship of this activity to I.Q. was low (Table III). The hypothesis of no significant relationship was accepted for this task.

It seemed that the students ranked low (.083) on the softball test because of their weak shoulder girdle (Table III). Very few had much strength in their arms and shoulders. This evidently was not emphasized in previous programs. So the hypothesis of no significant relationship was also accepted for this task.

The girls did not perform as well on the sit-ups, 600-yard walk-run, shuttle run and softball throw even though the majority were average or above in I.Q. It must be understood that the same students who scored high on broad jump and 50-yard dash took the other four tests and did not perform as well.

Thus since this study included students who were mostly average and above on the test of mental ability, (Table II) and since there was a high relationship between I.Q. and Broad Jump and 50-yard Dash, (Table III), one could infer that brighter subjects think and react quicker and these qualities enhance performance on at least some tasks.

CHAPTER V

SUMMARY AND CONCLUSIONS

Physical fitness has a long and involved history. It had been of great importance to nations in ancient times and has gained great stature today due to Dr. Hans Kraus and his comparison of American and European children in 1954. One of the first results of this test was the Council on Youth Fitness which has had far reaching effects on the physical education programs.

The purpose of the study was to investigate the relationship of physical fitness to intelligence. More specifically to test the hypothesis on each of the 6 tests that there is no significant relationship between intelligence and physical fitness on a standardized physical fitness test.

Eighty-nine eighth grade girls of Salina Junior High South were involved in the test. The girls were given a PMA test and the AAHPER Youth Fitness test. The writer then used the rank difference correlation comparing I.Q. and each one of the AAHPER tests. Although most of the literature indicated there was a positive relationship between I.Q. and physical ability, this study indicated a significant relationship on two out of six correlations. (See following table). The other four showed a positive trend. The hypothesis was rejected for the broad jump and the 50-yard dash and accepted for the sit-ups, 600-yard walk-run, shuttle run and the softball throw.

TABLE IV
CORRELATION SUMMARY

TEST	P
Broad Jump	.319***
50-yard Dash	.178*
Sit-ups	.167
Shuttle Run	.154
600-yard walk-run	.133
Softball Throw	.083

This research seemed to indicate that there is a significant relationship between I.Q. and some motor tasks.

The writer suggests that future research be done using a low I.Q. group, using both sexes, and using the results at the beginning of the year and at the end of the year.

APPENDIX

TABLE V

RANK DIFFERENCE CORRELATION OF I.Q. AND SIT-UPS

STUDENT	I.Q.	SIT-UPS	D	D ²
71	1	35	-34	1156.00
42	2.5	15	-12.5	156.25
45	2.5	15	-12.5	156.25
1	4	15	-11	121.00
75	5	15	-10	100.00
43	6.5	45.5	-39	1521.00
29	6.5	15	- 8.5	72.25
35	9.5	15	- 5.5	30.25
80	9.5	62.5	-53	2809.00
87	9.5	62.5	-53	2809.00
18	9.5	15	- 5.5	30.25
7	13	80.5	-67.5	4556.25
34	13	43	-30	900.00
69	13	51	-38	1444.00
22	15.5	62.5	-47	2209.00
63	15.5	51	-35.5	1260.25
17	18	40.5	-22.5	506.25
24	18	15	+ 3	9.00
57	18	15	+ 3	9.00
56	20	62.5	-42.5	1806.25
38	22	32.5	-10.5	110.25

TABLE V (CONT.)

STUDENT	I.Q.	SIT-UPS	D	D ²
61	22	15	+ 7	49.00
82	22	62.5	-40.5	1640.00
4	25.5	88.5	-63	3969.00
9	25.5	15	+10.5	110.25
74	25.5	62.5	-37	1369.00
84	25.5	86	-60.5	3660.25
81	29.5	15	+14.5	210.25
60	29.5	15	+14.5	210.25
55	29.5	40.5	-11	121.00
32	29.5	76.5	-47	2209.00
15	34	72.5	-38.5	1482.25
25	34	55.5	-21.5	462.25
46	34	51	-17	289.00
59	34	15	+19	361.00
83	34	74	-40	1600.00
10	38	55.5	-17.5	306.25
12	38	15	+23	529.00
48	38	62.5	-24.5	600.25
13	41	51	-10	100.00
39	41	15	+26	676.00
77	41	32.5	+ 8.5	72.25
19	43.5	70	-26.5	702.25
36	43.5	82.5	-39	1521.00

TABLE V (CONT.)

STUDENT	I.Q.	SIT-UPS	D	D ²
8	45.5	15	+30.5	930.25
44	45.5	70	-24.5	600.25
47	48	51	- 3	9.00
58	48	72.5	-24.5	600.25
89	48	79	-31	961.00
65	50.5	51	- .5	.25
67	50.5	15	+34.5	1190.25
14	53.5	40.5	+13	169.00
28	53.5	15	+38.5	1482.25
52	53.5	80.5	-27	729.00
53	53.5	15	+38.5	1482.25
79	56.5	15	+41.5	1722.25
85	56.5	84.5	-28	784.00
11	58.5	15	+43.5	1892.25
27	58.5	62.5	- 4	16.00
26	61	31	+30	900.00
54	61	15	+46	2116.00
78	61	37	+24	576.00
88	63	70	- 7	49.00
40	65.5	15	+50.5	2550.25
68	65.5	15	+50.5	2550.25
76	65.5	76.5	-11	121.00
86	65.5	15	+50.5	2550.25

TABLE V (CONT.)

STUDENT	I.Q.	SIT-UPS	D	D ²
66	68.5	84.5	-16	256.00
72	68.5	87	-18.5	342.25
62	70	51	+19	361.00
5	73	62.5	+10.5	110.25
16	73	76.5	- 3.5	12.25
23	73	15	+58	3364.00
33	73	62.5	+10.5	110.25
64	73	45.5	+27.5	756.25
6	76.5	45.5	+31	961.00
41	76.5	45.5	+31	961.00
70	78	15	+63	3969.00
30	79	62.5	+16.5	272.25
49	80	34	+46	2116.00
2	82.5	15	+67.5	4556.25
20	82.5	37	+45.5	2070.25
21	82.5	15	67.5	4556.25
31	82.5	40.5	42	1764.00
73	85	82.5	+ 2.5	6.25
50	86.5	62.5	+24	576.00
51	86.5	76.5	+10	100.00
37	88	88.5	- .5	.25
3	89	37	+52	2704.00

TABLE VI

RANK DIFFERENCE CORRELATION OF I.Q. AND BROAD JUMP

STUDENT	I.Q.	BROAD JUMP	D	D ²
71	1	73.5	-72.5	5256.25
42	2.5	48	-45.5	2070.25
45	2.5	57	-54.5	2970.25
1	4	23.5	-19.5	380.25
75	5	83.5	-78.5	6162.25
43	6.5	51.5	-45	2025.00
29	6.5	11.5	- 5	25.00
35	9.5	3	+ 6.5	42.25
80	9.5	31	-31	961.00
87	9.5	4.5	+ 5	25.00
18	9.5	2	+ 7.5	56.25
7	13	11.5	+ 1.5	2.25
34	13	16	- 3	9.00
69	13	80.5	-67.5	4556.25
22	15.5	48	-32.5	1056.25
63	15.5	45	-29.5	870.25
17	18	16	+ 2	4.00
24	18	1	+17	289.00
57	18	39	-21	441.00
56	20	44	-24	576.00
38	22	23.5	- 1.5	2.25
61	22	32.5	-10.5	110.25

TABLE VI (CONT.)

STUDENT	I.Q.	BROAD JUMP	D	D ²
82	22	11.5	+10.5	110.25
4	25.5	39	-13.5	182.25
9	25.5	16	+ 9.5	90.25
74	25.5	87.5	-62	3844.00
84	25.5	39	-13.5	182.25
81	29.5	23.5	+ 6	36.00
60	29.5	32.5	- 3	9.00
55	29.5	39	- 9.5	90.25
32	29.5	80.5	-51	2601.00
15	34	44	-10	100.00
25	34	9	+25	625.00
46	34	80.5	-46.5	2162.25
59	34	77	-43	1849.00
83	34	73.5	-39.5	1560.25
10	38	64	-26	676.00
12	38	7	+31	961.00
48	38	80.5	-42.5	1806.25
13	41	60.5	-19.5	380.25
39	41	29	+12	144.00
77	41	23.5	+17.5	306.25
19	43.5	16	+27.5	756.25
36	43.5	16	+27.5	756.25
8	45.5	7	+38.5	1482.25

TABLE VI (CONT.)

STUDENT	I.Q.	BROAD JUMP	D	D ²
44	45.5	11.5	+34	1156.00
47	48	54.5	- 6.5	42.25
58	48	7	+41	1681.00
89	48	70.5	-22.5	506.25
65	50.5	51.5	- 1	1.00
67	50.5	65	-14.5	210.25
14	53.5	19	+34.5	1190.25
28	53.5	64	-10.5	110.25
52	53.5	77	-23.5	552.25
53	53.5	36	+17.5	306.25
79	56.5	39	+17.5	306.25
85	56.6	54.5	+ 2	4.00
11	58.5	23.5	+35	1225.00
27	58.5	23.5	+35	1225.00
26	61	64	- 3	9.00
54	61	68	- 7	49.00
78	61	54.5	+ 6.5	42.25
88	63	23.5	+39.5	1560.25
40	65.5	23.5	+42	1764.00
68	65.5	54.5	+11	121.00
76	65.5	50	+15.5	240.25
86	65.5	29	+36.5	1332.25
66	68.5	68	+ .5	.25

TABLE VI (CONT.)

STUDENT	I.Q.	BROAD JUMP	D	D ²
72	68.5	73.5	- 5	25.00
62	70	68	+ 2	4.00
5	73	87.5	-14.5	210.25
16	73	85	-12	144.00
23	73	77	- 4	16.00
33	73	34.5	+38.5	1482.25
64	73	34.5	+38.5	1482.25
6	76.5	29	+47.5	2256.25
41	76.5	44	+32.5	1056.25
70	78	60.5	+17.5	306.25
30	79	73.5	+ 5.5	30.25
49	80	60.5	+19.5	380.25
2	82.5	48	+34.5	1190.25
20	82.5	4.5	+78	6084.00
21	82.5	86	- 3.5	12.25
31	82.5	70.5	+12	144.00
73	85	83.5	+ 1.5	2.25
50	86.5	44	+42.5	1806.25
51	86.5	60.5	+26	676.00
37	88	64	+24	576.00
3	89	89	0	.00

TABLE VII

RANK DIFFERENCE CORRELATION OF I.Q. AND 50-YARD DASH

STUDENT	I.Q.	50-YARD DASH	D	D ²
71	1	78	-77	5929.00
42	2.5	20.5	-18	324.00
45	2.5	7	- 4.5	20.25
1	4	30.5	-26.5	702.25
75	5	74.5	-69.5	4830.25
43	6.5	13	- 6.5	42.25
29	6.5	69.5	-63	3969.00
35	9.5	39	-29.5	870.25
80	9.5	54	-44.5	1980.25
87	9.5	20.5	-11	121.00
18	9.5	2	+ 7.5	56.25
7	13	54	-41	1681.00
34	13	10	+ 3	9.00
69	13	83	-70	4900.00
22	15.5	30.5	-15	225.00
63	15.5	39	-23.5	552.25
17	18	39	-21	441.00
24	18	1	+17	289.00
57	18	85.5	-67.5	4556.25
56	20	64.5	-44.5	1980.25
38	22	20.5	+ 1.5	2.25

TABLE VII (CONT.)

STUDENT	I.Q.	50-YARD DASH	D	D ²
61	22	68	-46	2116.00
82	22	39	-17	289.00
4	25.5	30.5	- 5	25.00
9	25.5	4	+21.5	462.25
74	25.5	78	-52.5	2756.25
84	25.5	64.5	-39	1521.00
81	29.5	20.5	+ 9	81.00
60	29.5	54	-24.5	600.25
55	29.5	45.5	-16	256.00
32	29.5	88	-58.5	3422.25
15	34	45.5	-11.5	132.25
25	34	30.5	+ 3.5	12.25
46	34	39	- 5	25.00
59	34	7	+27	729.00
83	34	78	-44	1936.00
10	38	20.5	+17.5	306.25
12	38	20.5	+17.5	306.25
48	38	72	-34	1156.00
13	41	59.5	-18.5	342.25
39	41	20.5	+20.5	420.25
77	41	20.5	+20.5	420.25
19	43.5	13	+30.5	930.25
36	43.5	59.5	-16	256.00

TABLE VII (CONT.)

STUDENT	I.Q.	50-YARD DASH	D	D ²
8	45.5	10	+35.5	1260.25
44	45.5	30.5	+15	225.00
47	48	39	+ 9	81.00
58	48	39	+ 9	81.00
89	48	69.5	-21.5	462.25
65	50.5	13	+37.5	1406.25
67	50.5	54	- 3.5	12.25
14	53.5	4	+49.5	2450.25
28	53.5	64.5	-11	121.00
52	53.5	30.5	+23	529.00
53	53.5	54	- .5	.25
79	56.5	45.5	+11	121.00
85	56.5	54	+ 2.5	6.25
11	58.5	20.5	+38	1444.00
27	58.5	54	+ 4.5	20.25
26	61	64.5	- 3.5	12.25
54	61	64.5	- 3.5	12.25
78	61	78	-17	289.00
88	63	49.5	+13.5	182.25
40	65.5	59.5	+ 6	36.00
68	65.5	45.5	+20	400.00
76	65.5	72	- 6.5	42.25
86	65.5	45.5	+20	400.00

TABLE VII (CONT.)

STUDENT	1.Q.	50-YARD DASH	D	D ²
66	68.5	20.5	+48	2304.00
72	68.5	30.5	+38	1444.00
62	70	87	-17	289.00
5	73	81.5	- 8.5	72.25
16	73	81.5	- 8.5	72.25
23	73	78	- 5	25.00
33	73	4	+69	4761.00
64	73	20.5	+52.5	2756.25
6	76.5	20.5	+56	3136.00
41	76.5	74.5	+ 2	4.00
70	78	72	+ 6	36.00
30	79	30.5	+48.5	2352.25
49	80	64.5	+15.5	240.25
2	82.5	30.5	+52	2704.00
20	82.5	7	+75.5	5700.00
21	82.5	84	- 1.5	2.25
31	82.5	59.5	+23	529.00
73	85	10	+75	5625.00
50	86.5	49.5	+37	1369.00
51	86.5	45.5	+41	1681.00
37	88	85.5	+ 2.5	6.25
3	89	89	0	.00

TABLE VIII
RANK DIFFERENCE CORRELATION OF I.Q. AND 600-YARD RUN-WALK

STUDENT	I.Q.	600-YARD RUN-WALK	D	D ²
71	1	84	-83	6889.00
42	2.5	46	-43.5	1892.25
45	2.5	21	-18.5	342.25
1	4	9.5	- 5.5	30.25
75	5	42	-37	1369.00
43	6.5	54.5	-48	2304.00
29	6.5	44	-37.5	1406.25
35	9.5	66.5	-57	3249.00
80	9.5	15.5	- 6	36.00
87	9.5	38	-28.5	812.25
18	9.5	26.5	-17	289.00
7	13	18	- 5	25.00
34	13	54.5	-41.5	1722.25
69	13	79	-66	4356.00
22	15.5	68.5	-53	2809.00
63	15.5	12	+ 3.5	12.25
17	18	19.5	- 1.5	2.25
24	18	1.5	+16.5	272.25
57	18	54.5	-36.5	1332.25
56	20	33.5	-13.5	182.25
38	22	38	-11	256.00
61	22	52	-30	900.00

TABLE VIII (CONT.)

STUDENT	I.Q.	600-YARD RUN-WALK	D	D ²
82	22	15.5	+ 6.5	42.25
4	25.5	80.5	-55	3025.00
9	25.5	6	+19.5	380.25
74	25.5	58	-32.5	1056.25
84	25.5	68.5	-43	1849.00
81	29.5	6	+23.5	552.25
60	29.5	40	-10.5	110.25
55	29.5	35.5	- 6	36.00
32	29.5	78	-48.5	2352.25
15	34	23.5	+10.5	110.25
25	34	58	-24	576.00
46	34	82.5	-48.5	2352.25
59	34	49.5	-15.5	240.25
83	34	28.5	+ 5.5	30.25
10	38	60.5	-22.5	506.25
12	38	22	+16	256.00
48	38	75	-37	1369.00
13	41	76.5	-35.5	1260.25
39	41	35.5	+ 5.5	30.25
77	41	38	+ 3	9.00
19	43.5	26.5	+17	289.00
36	43.5	72	-28.5	812.25
8	45.5	9.5	+36	1296.00

TABLE VIII (CONT.)

STUDENT	I.Q.	600-YARD WALK-RUN	D.	D ²
44	45.5	23.5	+22	484.00
47	48	51	- 3	9.00
58	48	8	+40	1600.00
89	48	60.5	-12.5	156.25
65	50.5	62.5	-12	144.00
67	50.5	48	+ 2.5	6.25
14	53.5	3.5	+50	2500.00
28	53.5	64.5	-11	121.00
52	53.5	44	+ 9.5	90.25
53	53.5	28.5	+25	625.00
79	56.5	47	+ 9.5	90.25
85	56.5	49.5	+ 7	49.00
11	58.5	76.5	-18	324.00
27	58.5	6	+52.5	2756.25
26	61	74	-13	169.00
54	61	33.5	+27.5	756.25
78	61	71	-10	100.00
88	63	41	+22	484.00
40	65.5	1.5	+64	4096.00
68	65.5	30	+35.5	1260.25
76	65.5	62.5	+ 3	9.00
86	65.5	86	-20.5	420.25
66	68.5	64.5	+ 4	16.00

TABLE VIII (CONT.)

STUDENT	I.Q.	600-YARD RUN-WALK	D	D ²
72	68.5	3.5	+65	4225.00
62	70	80.5	-10.5	110.25
5	73	85	-12	144.00
16	73	66.5	+ 6.5	42.25
23	73	89	-16	256.00
33	73	58	+15	225.00
64	73	15.5	+57.4	3306.25
6	76.5	31.5	+45	2025.00
41	76.5	12	+64.5	4160.25
70	78	15.5	+62.5	3906.25
30	79	70	+ 9	81.00
49	80	44	+36	1296.00
2	82.5	19.5	+63	3969.00
20	82.5	82.5	0	..00
21	82.5	87	- 4.5	20.25
31	82.5	12	+70.5	4970.25
73	85.	31.5	-53.5	2862.25
50	86.5	54.5	+32	1024.00
51	86.5	25	+61.5	3782.25
37	88	73	+15	225.00
3	89	88	+ 1	1.00

TABLE IX

RANK DIFFERENCE CORRELATION OF I.Q. AND SHUTTLE RUN

STUDENT	I.Q.	SHUTTLE RUN	D	D ²
71	1	83.5	-82.5	6806.25
42	2.5	72.5	-70	4900.00
45	2.5	38.5	-36	1296.00
1	4	19	-15	225.00
75	5	51.5	-46.5	2162.25
43	6.5	34	-27.5	756.25
29	6.5	51.5	-45	2025.00
35	9.5	29	-19.5	380.25
80	9.5	22.5	-13	169.00
87	9.5	13.5	- 4	16.00
18	9.5	25.5	-16	256.00
7	13	57.5	-44.5	1980.25
34	13	1	+12	144.00
69	13	75.5	-62.5	3906.25
22	15.5	47	-31.5	992.25
63	15.5	34	-18.5	342.25
17	18	51.5	-33.5	1122.25
24	18	51.5	-33.5	1122.25
57	18	16	+ 2	4.00
56	20	62.5	-42.5	1806.25
38	22	2.5	+19.5	380.25

TABLE IX (CONT.)

STUDENT	I.Q.	SHUTTLE RUN	D.	D ²
61	22	42.5	-20.5	420.25
82	22	16	+ 6	36.00
4	25.5	34	- 8.5	72.25
9	25.5	5.5	+20	400.00
74	25.5	78	-52.5	2756.25
84	25.5	51.5	-26	676.00
81	29.5	4	+25.5	650.25
60	29.5	8.5	+21	441.00
55	29.5	66	-36.5	1332.25
32	29.5	72.5	-43	1849.00
15	34	68	-34	1156.00
25	34	22.5	+11.5	132.25
46	34	66	-32	1024.00
59	34	47	-13	169.00
83	34	62.5	-28.5	812.25
10	38	62.5	-24.5	600.25
12	38	38.5	- .5	.25
48	38	69	-31	961.00
13	41	80	-39	1521.00
39	41	29	+12	144.00
77	41	2.5	+38.5	1482.25
19	43.5	75.5	-32	1024.00
36	43.5	29	-14.5	210.25

TABLE IX (CONT.)

STUDENT	I.Q.	SHUTTLE RUN	D	D ²
8	45.5	8.5	+37	1369.00
44	45.5	29	+16.5	272.25
47	48	42.5	+ 5.5	30.25
58	48	5.5	+42.5	1806.25
89	48	42.5	+ 5.5	30.25
65	50.5	34	+16.5	272.25
67	50.5	79	-28.5	812.25
14	53.5	8.5	+45	2025.00
28	53.5	83.5	-30	900.00
52	53.5	57.5	- 4	16.00
53	53.5	45	+ 8.5	72.25
79	56.5	81	-24.5	600.25
85	56.5	57.5	- 1	1.00
11	58.5	29	+29.5	870.25
27	58.5	22.5	+36	1296.00
26	61	86	-25	625.00
54	61	62.5	- 1.5	2.25
78	61	57.5	+ 3.5	12.25
88	63	57.5	+ 5.5	30.25
40	65.5	19	+46.5	2162.25
68	65.5	16	+49.5	2450.25
76	65.5	70.5	- 5	25.00
86	65.5	8.5	+57	3249.00

TABLE IX (CONT.)

STUDENT	I.Q.	SHUTTLE RUN	D.	D ²
66	68.5	86	-17.5	306.25
72	68.5	38.5	+30	900.00
62	70	86	-16	256.00
5	73	75.5	- 2.5	6.25
16	73	38.5	+34.5	1190.25
23	73	70.5	+ 2.5	6.25
33	73	19	+54	2916.00
64	73	11.5	+61.5	3782.25
6	76.5	11.5	+65	4225.00
41	76.5	34	+42.5	1806.25
70	78	75.5	+ 2.5	6.25
30	79	22.5	+56.5	3192.25
49	80	25.5	+54.5	2970.25
2	82.5	13.5	+69	4761.00
20	82.5	51.5	+31	961.00
21	82.5	66	+16.5	272.25
31	82.5	88	- 5.5	30.25
73	85	42.5	+42.5	1806.25
50	86.5	47	+39.5	1560.25
51	86.5	57.5	+29	841.00
37	88	82	+ 6	36.00
3	89	89	0	.00

TABLE X

RANK DIFFERENCE CORRELATION OF I.Q. AND SOFTBALL THROW

STUDENT	I.Q.	SOFTBALL THROW	D	D ²
71	1	65	-64	4096.00
42	2.5	18	-15.5	240.25
45	2.5	59.5	-57	3249.00
1	4	3	+ 1	1.00
75	5	59.5	-54.5	2970.25
43	6.5	77.5	-71	5041.00
29	6.5	52	-45.5	2070.25
35	9.5	11	- 1.5	2.25
80	9.5	43	-33.5	1122.25
87	9.5	52	-42.5	1806.25
18	9.5	2	+ 7.5	56.25
7	13	32.5	-19.5	380.25
34	13	89	-76	5776.00
69	13	74	-61	3721.00
22	15.5	13.5	+ 2	4.00
63	15.5	81.5	-66	4356.00
17	18	18	0	.00
24	18	9	+ 9	81.00
57	18	52	-34	1156.00
56	20	47	-27	729.00
38	22	28.5	- 6.5	42.25
61	22	38	-16	256.00

TABLE X (CONT.)

STUDENT	I.Q.	SOFTBALL THROW	D	D ²
82	22	38	-16	256.00
4	25.5	30	- 4.5	20.25
9	25.5	6.5	+19	361.00
74	25.5	38	-12.5	156.25
84	25.5	81.5	-56	3136.00
81	29.5	18	+11.5	132.25
60	29.5	59.5	-30	900.00
55	29.5	23.5	+ 6	36.00
32	29.5	52	-22.5	506.25
15	34	47	-13	169.00
25	34	68	-34	1156.00
46	34	52	-18	324.00
59	34	18	+16	256.00
83	34	68	-34	1156.00
10	38	25	+13	169.00
12	38	43	- 5	25.00
48	38	77.5	-39.5	1560.25
13	41	11	+30	900.00
39	41	81.5	-40.5	1640.25
77	41	28.5	+12.5	156.25
19	43.5	21.5	+22	484.00
36	43.5	65	-21.5	462.25
8	45.5	32.5	+13	169.00

TABLE X (CONT.)

STUDENT	I.Q.	SOFTBALL THROW	D.	D ²
44	45.5	26.5	+19	361.00
47	48	52	- 4	16.00
58	48	11	+37	1369.00
89	48	74	-26	676.00
65	50.5	65	-14.5	210.25
67	50.5	32.5	+18	324.00
14	53.5	6.5	+47	2209.00
28	53.5	71	-17.5	306.25
52	53.5	86.5	-33	1089.00
53	53.5	13.5	-40	1600.00
79	56.5	59.5	- 3	9.00
85	56.5	81.5	-25	625.00
11	58.5	43	+15.5	240.25
27	58.5	32.5	+26	676.00
26	61	86.5	-25.5	650.25
54	61	47	+14	196.00
78	61	74	-13	169.00
88	63	43	+20	400.00
40	65.5	4	+61.5	3782.25
68	65.5	52	+13.5	182.25
76	65.5	88	-22.5	506.25
86	65.5	38	+27.5	756.25
66	68.5	26.5	+42	1764.00

TABLE X (CONT.)

STUDENT	I.Q.	SOFTBALL THROW	D	D ²
72	68.5	70	- 1.5	2.25
62	70	74	- 4	16.00
5	73	81.5	- 8.5	72.25
16	73	81.5	- 8.5	72.25
23	73	23.5	+49.5	2450.25
33	73	1	+72	5184.00
64	73	18	+55	3025.00
6	76.5	15	+61.5	3782.25
41	76.5	38	+38.5	1482.25
70	78	59.5	+18.5	342.25
30	79	59.5	+19.5	380.25
49	80	43	+37	1369.00
2	82.5	5	+77.5	6006.25
20	82.5	21.5	+61	3721.00
21	82.5	59.5	+23	529.00
31	82.5	74	+ 8.5	72.25
73	85	68	+17	289.00
50	86.5	8	+78.5	6162.25
51	86.5	35	+51.5	2652.25
37	88	59.5	+28.5	812.25
3	89	85	+ 4	16.00

BIBLIOGRAPHY

BIBLIOGRAPHY

- AAHPER. Fit to Teach. Washington, D.C.: National Education Association, 1957.
- Andrews, Gladys, Jeanette Sanborn. Physical Education for Today's Boys and Girls. Boston: Allyn and Bacon Inc., 1960.
- Barrow, Harold. A Practical Approach to Measurement in Physical Education. Philadelphia: Lea and Feibiger, 1964.
- Bovard, John, and Frederick Cozens. Test and Measurements in Physical Education. Philadelphia: W. B. Saunders Company, 1950.
- Brace, David. Health and Physical Education for Junior and Senior High Schools. New York: A. S. Barnes, 1948.
- Brown, Camile, and Rosalind Cassidy. Theory in Physical Education: A Guide to Program Change. Philadelphia: Lea and Febiger, 1963.
- Brownell, Clifford and Patricia Hagman. Physical Education Foundations and Principles. New York: McGraw-Hill Book Company, 1951.
- Bucher, Charles. Foundations of Physical Education. St. Louis: C. V. Mosby Company, 1956.
- Chase, Clinton. Elementary Statistical Procedures. New York: McGraw-Hill Book Company, 1944.
- Crampton, Charles. Physical Education and Training. New York: McGraw-Hill Book Company, 1944.
- Cowell, Charles and Frances Wellman. Philosophy and Principles of Physical Education. New Jersey: Prentice-Hall Inc., 1963.
- Cureton, Thomas. Physical Fitness and Dynamic Health. New York: Dial Press, 1965.
- Davis, Elwood and Earl Wallis. Toward Better Teaching in Physical Education. New Jersey: Prentice-Hall Inc., 1961.
- Davis, Elwood and John Lawther. Successful Teaching in Physical Education. New Jersey: Prentice-Hall Inc., 1948.
- Dauer, Victor. Fitness for Elementary School Children. Minnesota: Burgess Publishing Company, 1966.
- Gourevitch, Vivian. Statistical Methods: A Problem-Solving Approach. Boston: Allyn and Bacon, Inc., 1965.

- Jokl, Ernst, And Ernst Simon. International Research in Sports and Physical Education. Illinois: Charles C. Thomas Company, 1964.
- Jokl, Ernst. Physiology of Exercise. Illinois: Charles C. Thomas Company, 1964.
- Jones, Edwina, and Edna Morgan. Methods and Materials in Elementary Physical Education. New York: World Book Company, 1957.
- Kiphuth, Robert. How to be Fit. Connecticut: Yale University Press, 1950.
- Kozman, Hilda, Rosalind Cassidy and Chester Jackson. Methods in Physical Education. Philadelphia, W. B. Saunders Company, 1956.
- McLoy, Charles. Philosophical Basis for Physical Education. New York: Appleton-Century-Crofts, Inc., 1940.
- Moorhouse, Lawrence and Augustus Miller. Physiology of Exercise. St. Louis: C. V. Mosby Company, 1959.
- Neilson, N. P., and Winifred Van Hagen. Physical Education for Elementary Schools. New York: The Ronald Press Company, 1956.
- Sanborn, Jeannette and Betty Hartman. Issues in Physical Education. Philadelphia: Lea and Febiger, 1964.
- Sapora, Allen. The Theory of Play and Recreation. New York: The Ronald Press Company, 1961.
- Sharman, Jackson. The Teaching of Physical Education. New York: A. S. Barnes and Company, 1937.
- Schneider, Edward, and Peter Karpovich. Physiology of Muscular Activity. Philadelphia: W. B. Saunders Company, 1948.
- Seaton, Don. Physical Education Handbook. New York: Prentice-Hall Inc., 1954.
- Steinhaus, Arthur. Toward an Understanding of Health and Physical Education. Iowa: William C. Brow Company, 1963.
- Stroup, Francis. Measurement in Physical Education. New York: The Ronald Press Company, 1957.
- Vannier, Mary Helen, and Hollis Fait. Teaching Physical Education in Secondary Schools. Philadelphia: W. B. Saunders Company, 1958.
- Vannier, Mary Helen and Edith Poindexter. Physical Activities for College Women. Philadelphia: W. B. Saunders Company, 1964.

PERIODICALS

- American Medical Association. "Need for Varied Activity in Physical Education," The Journal of Health, Physical Education and Recreation, 36:6, June, 1965.
- Brace, D. K. "Motor Learning of Feeble Minded Girls" Research Quarterly, December, 1958, 269-275.
- Bucher, Charles. "Health, Physical Education and Academic Achievement," NEA Journal, 54:38-40, May, 1965.
- Foreman, K. E. "Stretching the Mind," Journal of Health, Physical Education and Recreation, 36:19, May, 1965.
- Gutin, Bernard. "Effect of Increase in Physical Fitness on Mental Ability Following Physical and Mental Stress," American Association of Health, Education and Recreation Research Quarterly, 37:211-220, May, 1966.
- Hart, M. E., and C. T. Shay. "Relationship between Physical Fitness and Academic Success," American Association of Health, Physical Education and Recreation Research Quarterly, 35:443-445, October, 1964.
- Kulcinski, L. E. "The Relation of Intelligence to the Learning of Fundamental Muscular Skills," Research Quarterly, American Association of Health, Physical Education and Recreation, December, 1945, 266-276.
- Lockhart, Aileene. "Conditions of Effective Motor Learning," Journal of Health, Physical Education and Recreation, February, 1967, 36-39.
- Stein, Julian. "Reliability of the Youth Fitness Test," American Association of Health, Physical Education and Recreation Research Quarterly, 35:328-329, October, 1964.
- Stein, Julian. "Motor Function and Physical Fitness of the Mentally Retarded," Rehabilitation Literature, 24:230-242, August, 1963.

MANUALS

- AAHPER Youth Fitness Manual. American Association of Health, Physical Education and Recreation. Washington; 1965.
- Science Research Associates. Examiner's Manual-Primary Mental Abilities for grades 6-9. 1962.

RELATION BETWEEN INTELLIGENCE AND PHYSICAL FITNESS
OF EIGHTH GRADE GIRLS ENROLLED AT
SALINA JUNIOR HIGH SOUTH SALINA, KANSAS 1967-68

by

PATRICIA MONTY

B.S., Marymount College, 1967

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the
requirements for the degree

MASTER OF SCIENCE

College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1968

ABSTRACT

Physical fitness has always been an important consideration in physical education. There have been periods when particular stress has been placed on fitness especially during war years.

The influence made by Dr. Hans Kraus was far-reaching with his comparison of American and European children. These results initiated the Youth Fitness Council.

The purpose of the study was to test the hypothesis that there is no significant relationship between intelligence and physical fitness on a standardized physical fitness test.

Eighty-nine girls at Salina Junior High South were involved in the testing. The AAHPER Youth Fitness test was administered at the beginning of the school term. The test included sit-ups, broad jump, 50-yard dash, 600-yard walk-run, shuttle run, and the softball throw.

The PMA test was given to the 89 girls by the school counselor. The writer then used the rank difference correlation comparing I.Q. and each one of the AAHPER tests.

The study indicated a significant relationship on the broad jump (.319), and the 50-yard dash (.178). The sit-ups (.167), 600-yard walk-run (.133), shuttle run (.154), and softball throw (.083) showed a positive trend. The hypothesis was rejected for the broad jump and the 50-yard dash, and accepted for the sit-ups, 600-yard walk-run, shuttle run, and softball throw.

The research seemed to indicate that there is a significant relationship between intelligence and some motor tasks.